Ex. 02
Susan Athey Opening Opinion Summaries

III. SUMMARY OF OPINIONS

17. Today, the market for mobile smartphone operating system platforms is a duopoly, with market leaders Apple and Android together accounting for almost 100% of mobile smartphone revenue share outside of China. Mobile platform competition is influenced by the presence of indirect network effects, whereby users gain value from having access to applications (apps) on a platform, and app developers profit from reaching a given platform's user base.

18. Mobile platform users today rely on a large number and variety of apps. There are often direct network effects among users of an app that, in the absence of impediments, extend across different platforms (e.g., for networked games). Further, groups of users such as families often share subscriptions to apps and wish to coordinate on a particular app for collaboration. A large share of users (or their families) have existing relationships with one of the two dominant mobile platforms as well as with a number of specific apps. A user who considers leaving one platform and joining another faces app-related switching costs, including the costs of migrating and synchronizing her apps, purchases[3] and app data (and, in many cases, the costs of re-purchasing apps on the new platform).

19. User switching costs and mixing-and-matching costs reduce competition between mobile platforms and thus allow platforms to exert market power over both users and developers. The fact that app developers typically cannot induce users to switch platforms increases the market power platforms exert over developers. Developers have incentives to reduce user switching costs and mixing-and-matching costs, particularly where network effects or interoperability are important. However, developers face several frictions in doing so, including the fixed cost investments required to create the functionality to recognize users, their purchases and their data across platforms.

[3] By purchases I am referring to both app store purchases and in-app purchases.

[redacted]

20. Developers also incur costs of creating apps for an initial platform and porting them to additional platforms. There are further costs of maintaining and improving apps, some of which are platform-specific. Platform-specific investments will be worthwhile only if the platform's user base is large enough relative to these costs. This leads to a chicken-and-egg problem, where new platforms face a substantial "App Barrier to Entry." The history of failed entry attempts, despite large investments by major companies, underscores these barriers. These barriers further allow the incumbent platforms to maintain their market power.

21. Middleware can meaningfully reduce such user and developer costs, and thereby lessen mobile platforms' market power over users and developers and enable nascent competitive threats to emerge. Apple imposes a set of technical and contractual restrictions that block critical categories of middleware, interfering with the competitive process and maintaining the market power of the iOS Platform.[4] Specifically, Apple restricts developers' ability to use an independent Multi-Platform App Store, a multi-platform in-app payment system, or a cross-platform game or app streaming platform on iOS.

22. Middleware such as a Multi-Platform App Store can reduce user switching and mixing-and-matching costs across platforms, facilitate developer cross-platform support for user switching and mixing-and-matching, and reduce developer multi-homing costs. It does so by providing developers with technologies that work across platforms, which replace platform-specific technologies and reduce the costs of porting and multi-homing to smaller platforms. This improves welfare for users – for example, by enabling a family to purchase lower cost secondary devices for children without incurring app-related switching or mixing-and-matching costs.

23. In this way, middleware (e.g., a Multi-Platform App Store) is both a nascent competitive threat in the marketplace and can enable additional nascent competitive threats to emerge. To unleash the competitive process, middleware must first succeed in attracting an initial set of users and developers. Because middleware initially operates on existing platforms, it does not have to overcome the full chicken-and-egg problem (App Barrier to Entry) that new mobile platforms face. Users of the existing platforms can gradually transition to using apps based on middleware without switching their device or platform, and thus without giving up their

[4] I understand that Dr. Evans has concluded that Apple has substantial market power over iOS Platform app users and developers in the smartphone operating system market, and that Apple's conduct has effects on the market for the distribution of iOS apps and the market for payment processing for iOS apps. See the Expert Report of David S. Evans, Section V and Section VII.

existing apps and services. Thus, middleware has the potential to succeed in attracting users and developers even in a setting where entry of an entirely new mobile platform has proved extremely difficult.

24. Once middleware succeeds in attracting users and developers in one category of app, it can expand into additional categories of apps. The gradual expansion of the middleware can then enable entry from new or smaller players in the mobile platform market. For example, Amazon, which already offers a low-cost tablet using a forked version of Android, can potentially rely on a collection of middleware offering a critical mass of cross-platform apps to enable user mixing-and-matching, and eventually switching. Families might initially purchase a low-cost Amazon Fire Tablet as a child's device, to enable sharing of apps and purchases with the family's Apple devices. Eventually the family might switch to owning more Amazon devices as the new platform grows. Apple's restrictions prevent this type of competitive process from unfolding.

25. I demonstrate middleware's benefits to users and developers using Multi-Platform App Stores as an example. I review several Multi-Platform App Stores: Steam, the Epic Games Store (EGS), and GameClub. On the user side, these app stores allow a single log-in[5] feature and synchronize apps, purchases, and app local data across any platform on which the Multi-Platform App Store exists. On the developer side, app stores such as Steam, EGS, and GameClub provide developers with the infrastructure to enable users to more easily switch and mix-and-match. They also allow developers to release their apps on multiple platforms without incurring significant platform-specific upfront and ongoing development costs related to distribution and payment processing. This infrastructure is particularly important for driving developer support for new or smaller platforms. Apple's restrictions exclude Multi-Platform App Stores like Steam and the Epic Games Store, and Apple also restricts the functionality of GameClub on iOS.

26. Similarly, Apple's requirement that apps on iOS exclusively use Apple's own in-app payment (IAP) system for in-app purchases (other than physical goods) increases user switching costs and mixing-and-matching costs and makes it more difficult for developers to offer cross-platform services to users that would reduce these costs.

27. Streaming platforms are another promising type of middleware that can serve as an alternative Multi-Platform App Store. Streaming of apps with a streaming platform could provide the full experience of a typical downloaded app but delivered instead from servers over the internet. Importantly, streaming app distribution could reduce the friction of downloading apps. Streaming could increase the consumption of new apps in the

[5] "Can I use my Steam account on other computers? You may use your Steam account on any machine which can connect to the Steam network - Steam allows you to download and install any games registered to your account as soon as you log in." (Steam, "Can I use my Steam account on other computers?," https://support.steampowered.com/kb_article.php?ref=8963-EIKC-3767#multiple, accessed January 31, 2021.)

same way that streaming has increased the consumption of media content like music and video. For users, streaming of apps could provides a way of accessing apps that work across platforms and device types, without duplication of downloading or cumbersome and time-consuming management of purchases and subscriptions. Streaming also reduces hardware requirements, enabling older and less expensive devices to achieve similar functionality, thereby reducing the need for hardware upgrades or the purchase of expensive devices (e.g., for children). For developers, a streaming platform could reduce the costs of porting and maintaining apps across multiple platforms, since developers need only build or port their apps to a single cloud platform; from there, the app is delivered to users across device types from cloud servers. Apple imposes restrictions on alternative cross-platform app distributors that focus on streaming.

28. If it were not impeded by Apple's restrictions, middleware could have several pro-competitive effects. First, it could significantly reduce user switching costs across platforms. Second, it could reduce user mixing-and-matching costs. Third, it could facilitate developer investment in cross-platform services that facilitate user switching and mixing-and-matching. Fourth, it could reduce developer porting and multi-homing costs, particularly for new platforms.

29. In turn, these effects would have the potential to: (1) mitigate Apple's market power over users and developers, (2) increase competition among mobile platforms on both quality and price, and (3) increase the chance that mobile platform competitors could enter and/or gain traction (e.g., enable nascent competitive threats). As a result of increased competition, we would expect greater innovation in middleware, including developer services, app distribution services, and payments; in smartphone operating systems, hardware, and apps; and in other adjacent markets that contribute to cross-platform and cross-device experiences for users. The welfare benefits of these innovations would accrue to participants both inside and outside of Apple's platform.